C95-11

United States Department of Agriculture
Forest Service
Stanislaus National Forest
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File Code: 3420
Route To:

Date: April 14, 1995

Subject: Evaluation of Bark and Engraver Beetle Pine Mortality, Amador District, Eldorado National Forest

To: District Ranger, Amador Ranger District

On April 10, 1995. John Wenz, Entomologist, Forest Pest Management South Sierra Shared Service Area, accompanied by Dave Helton, Amador RD Timber Management Officer and Chuck Loffland, Wildlife Biologist, conducted a biological evaluation of a bark and engraver beetle-related situation on the Amador District of the Eldorado National Forest. The purpose of the evaluation was to assess the potential for beetles to spread from infested ponderosa pines on National Forest land (R14E T8N S4) and attack ponderosa pines on adjacent private property.

Results

Eight ponderosa pines in the immediate vicinity of the property boundary showed evidence of current or past infestation by bark and/or engraver beetles (Table 1). Trees #1 and #2 were attacked in the summer/fall of 1994 by the western pine beetle (WPB), Dendroctonus brevicomis (Coleoptera: Scolytidae). Both evidenced extensive woodpecker predation along the entire infested portion of the bole. Examination of the few sections of bark in the lower bole not affected by woodpecker activity found no live WPB brood. Since very few, if any, live WPB remain in Trees #1 and #2, the potential for WPB to emerge and attack nearby pines is very low.

Tree #3 showed evidence of WPB, the red turpentine beetle (RTB), D. valens, and extensive woodborer activity in the lower bole. No live beetle brood was found in the lower bole. Numerous exit holes were present in the bark indicating that beetle emergence has already occurred, probably in late summer/fall of 1994. Since the beetles have already left Tree #3, there is no threat to nearby pines.

Trees #4 and #5 had dead tops probably caused by pine engravers (Ips spp.). Needle retention in the top-killed portion of both trees was only 1 year and needle density was sparse. This indicates that both attack and emergence occurred in 1994. There was no evidence of attack by other bark beetles below the dead tops and the remaining live crowns (approximately 70% of the total tree height) appeared healthy. Evidence suggests that the engravers have already emerged from Trees #4 and #5 and there is no threat to nearby pines.

Tree #6 has a dead top that, because of relatively dense foliage and 2 to 3 years of needle retention, may be currently infested with pine engravers. As with trees #4 and #5, there is no evidence of bark beetle attack below the the

dead top. If live pine engraver brood are present in the top, they will likely emerge, depending to some extent on weather, sometime over the next 6 to 8 weeks. There is some chance that emerging adults will attack nearby pines.

Trees #7 and #8 are infested with RTB at the base of the bole up to about 5 feet. In addition, although there was no evidence of WPB in the lower boles, there were numerous small to medium-sized pitch tubes along the the boles of both trees extending from about 10 to 12 feet above the ground to above mid-bole. These pitch tubes, coupled with the relatively extensive crown fade, suggest that WPB has infested both trees. In addition, pine engravers may have attacked the top of either or both of the trees. As with Tree #6, the bark and engraver beetle broods, to the extent that they are actually present in these trees, can be expected to emerge over the next several weeks with some undefined probability of attacking nearby pines.

Discussion

It is obvious that if Trees #6, #7 and #8 are removed from the area and/or the beetle broods destroyed prior to emergence, those beetles will not be able to attack any trees. However, observations of mortality group dynamics in west-side Sierra Nevada mixed conifer stands do not suggest that WPB and pine engravers consistently emerge and attack nearby pines. Rather, the specific location of new WPB/pine engraver mortality groups are basically unpredictable implying that adult beetles may fly for some unknown distance and direction before attacking a new host. Bark and engraver beetle adult dispersal is poorly understood and, if the broods are not destroyed, it will not be possible to determine where the beetles that emerge from trees #1, #4 and #5 go. Further, if pines in the vicinity of the evaluation area, whether on Forest Service or private land, are attacked in the immediate future, it will not be possible to ascertain with certainty where the attacking beetles came from since native populations of WPB and pine engravers exist throughout the area.

Please contact John Wenz at (916) 573-2600 or (209) 532-3671 with any questions.

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enclosure

Table 1. Individual Ponderosa Pine Tree Data and Condition Information, Amador District, Eldorado National Forest (R14E T8N S4).

Tree #	DBH (inches)	Height (feet)	% Top-kill	Condition
1	8.5	40	100	Dead
2	11.3	50	100	Dead
3	28.0	85	100	Dead
4	30.8	120	20	Live with old dead top
5	33.5	120	15	Live with old dead top
6	29.1	100	15	Live with dead top
7	22.8	90	40	Expected to die within 6 months
8	22.4	90	75	Expected to die within 6 months